Opioids Past Present and Future

Edited by J. Hughes, H.O.J. Collier, M.J. Rance and M.B. Tyers

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xv + 226 pages, £24.00

This Festschrift in honour of Professor Hans W. Kosterlitz took its inspiration from a symposium at Churchill College, Cambridge in 1983 in celebration of his 80th birthday. The chapters in this volume are based on the contributions presented there and in addition, there is a thumb-nail sketch by A.T. McKnight of Hans Kosterlitz and an appendix listing his publications. The description of a new family of brain chemical messengers, the enkephalins and the endorphins, is to be found in current text-books, so our interest in'Opioids past' lies with the nature of the ever-applicable means described by those intimately involved in their discovery. Two routes and the happy existence of a specific antagonist, naloxone, are identified.

The opiate receptors were first detected by measuring the binding of radioactively labelled opiate compounds to fragments of brain neuronal membranes. Three separate groups, S.H. Snyder and C.B. Pert at Johns Hopkins University School of Medicine, and E.J. Simon at New York University School of Medicine, and Lars Terenius at the University of Uppsala developed these methods to show that opiate receptors were concentrated in those parts of brain and spinal cord where pain and emotions are perceived. A different, and in that it identified a true pharmacological receptor, a more precise preparation had been used by Hans Kosterlitz to identify morphine-like narcotic (dependent) opiates. This was the Trendelenburg preparation of the isolated guinea-pig ileum, and later, the electrically stimulated guinea-pig ileum and the mouse vas deferens. With these tests John Hughes and Hans Kosterlitz of the University of Aberdeen isolated two peptides from pig brain and named them enkephalins. They were chains of five amino acids where the terminus of one is methionine and the other leucine.

After an elegant introduction tracing the origins of Kosterlitz's contributions, J. Hughes (chapter 1) sketches the history of the extraction of 'Naloxone Reversible Activity' and introduces the nature of the actions and functions of opioid peptides derived by cleavage from three protein precursors. The same theme is stimulatingly reviewed by A. Goldstein in terms of their distribution and of their efficacy from five differing receptors (chapter 10). W.R. Martin (chapter 3) offers a steric theory to explain the ability of substituents of the morphine ligand to alter its binding position on the receptor. E.J. Simon and J.M. Miller review the evidence for multiple opioid receptors and consider the possibility that there exists only conformation of a single receptor. R.A. North (chapter 5) advances a unifying hypothesis that opiates inhibit calcium binding intracellularly. R.G. Hill, R. Morris and C.M. Pepper define the sites for opioid analgesia and note the difficulty of interpreting the evidence from electrophysiological experiments (chapter 6). A. Herz and M.J. Millan (chapter 7) consider the significance of the opioid peptides in the hypothalamic-pituitary axis. E.L. Way and A. Rezvani discuss the use of the guinea-pig ileum to assess tolerance and physical dependence and propose to extend the implied involvement of calcium ions in the analgesic effect of the opiates to tolerance and dependence. The late H.O.J. Collier, who so sadly died last year, makes a characteristically lucid analysis of tolerance and dependence and discusses the cellular site of the molecular mechanism of dependence. The difficult and complex theme of endogenous opioid function is thoughtfully reviewed by S.J. Watson, H. Akil, H. Khachaturian, E. Young and M.E. Lewis (chapter 11), while L. Terenius, F. Nyberg and A. Wahlstrom (chapter 12) report the state of the art in their meticulous characterisation of CSF endorphins in man. Finally, S.H. Snyder and L.D.

Fricker advance arguments for the role of the novel enzyme, enkephalin convertase in biosynthesis, its localization in chromaffin granules and the affinity of the hexapeptides for the enzyme. As the gut is a paradigm of the brain so is this text for the search for other brain peptides. This well-produced and reasonably priced book should be read by graduate students of pharmacology and biochemistry and should be found in their libraries.

George Brownlee

Biochemistry of Steroid Hormones (2nd Edition)

Edited by H.L.J. Makin

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xii + 714 pages, £75.00

The new edition of this book has almost doubled both in size and in the number of contributing authors compared with the first edition, and the editor implies that it is now primarily a steroid research reference book rather than an advanced student textbook as was the intended role of the first edition, maintaining a readable style. Generally, the book fulfils this remit and although there are 15 contributing authors, there is only a little overlap of information between chapters in a well-coordinated series of topics which are mini-reviews with good reference lists for further reading. Many of the topics have now been covered by different authors from those in the first edition, giving a new slant to the subjects as well as an update.

The addition of chapters on The Metabolism and Function of Vitamin D (De Luca) and Steroid Synthesis and Catabolism in the Fetus and Neonate (Shackleton) add to the scope of the book and there is a new section on Biliary Excretion and Enterohepatic Circulation (Honour) which would be a useful review for thse commencing research in this field. The chapter on Cholesterol Biosynthesis and Metabolism is perhaps too detailed for a book on steroid hormones (is cholesterol a hormone?) but does give an update in the important area of the role of LDL in the transport and availability of cholesterol to steroidogenic tissues. Analysis and assay of steroids are updated to include HPLC, and enzyme assays as well as column chromatography, GLC, TLC, protein binding assays and radioimmunoassay in two excellent chapters by Makin and Jeffcoate, respectively.

A valid criticism would be the fact that although the publication date is 1984, only eight of the fifteen chapters are updated to 1983, which results in the omission of some very important new concepts in the subject, such as the role of polyphosphoinositide metabolism in stimulus-secretion coupling in steroidogenic cells. This book is an essential purchase for any library in an institution where steroid endocrinology is a major research or teaching topic. It differs considerably from the first edition, and thus justifies its purchase even where the first addition is already available.

P.J. Hyatt